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TURBINICARPUS BOOLEANUS (CACTACEAE), A NEW SPECIES FROM NUEVO LEON, MEXICO

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ABSTRACT

A new species of *Turbinicarpus*, ***T. booleanus*** G.S. Hinton, is described from Nuevo León, México, where it occurs on gypsum outcrops. A map showing the distribution of the new species and the other tuberous-rooted taxa of *Turbinicarpus, T. mandragora,* and *T. subterraneus* var. *subterraneus*, is also provided.

KEY WORDS: Cactaceae, *Turbinicarpus*, México, Nuevo León, gypsum, systematics

Some species of *Turbinicarpus* (Backeb.) Buxb. & Backeb. occur consistently throughout the gypsum outcrops in Nuevo León, México. The gypsophilic species are usually like those that were once included in the genus *Gymnocactus* Backeb., a remarkable exception being the recently described *T. hoferi* J. Lüthy & A.B. Lau from the gypsum to the north of Aramberri, Nuevo León. Like other genera with gypsophilic members in this area, notably *Leucophyllum, Verbesina, Sedum, Aztekium, Geohintonia, Jaimehintonia,* and *Sophora, Turbinicarpus* contains narrowly endemic taxa which are often restricted to a single gypsum outcrop. The present novelty occurs in the Municipio of Galeana, in two localities separated a few kilometers from each other.

TURBINICARPUS BOOLEANUS G.S. Hinton, *spec. nov.* TYPE: MEXICO. Nuevo León: Mpio. Galeana, Y Griega, 1860 m, gypsum hillside, 1 Mar 1992, *Hinton et al. 21805* (HOLOTYPE: TEX; Isotypes: CANTE,ENCB, G.B. Hinton Herbarium).

Turbinicarpus mandragora (A. Berger) A.D. Zimmermann et *T. subterraneus* (Backeb.) A.D. Zimmermann var. *subterraneus* simile quoad radix tuberascens per collum gracilem ad caule connexa; caulibus singulis partim hypogaeis depressi-obovatis; collo hypogaeo plerumque 2-5 cm longo; in quoque areola spinis centralis duabus, superiore antrorsa inferiore porrecta,

ad basim albis cetero atrobrunneis vel nigris; spinis radialis vulgo 18-20 ubique albis vel apicem versus rubris vel brunneis; floribus magenteis; fructibus longitudinaliter dehiscentibus pulverulentis, squamis duabus stramineis ca. 1 mm longis.

Stems single, rarely branching, broadly obovate, 2.5-4.5 cm high, 2.5-5.5 cm in diameter, basally truncate in older specimens. Roots connected to the stem by a narrow, hypogeous neck; neck 1-5 cm long, 3-5 mm in diameter, usually straight but occasionally curved or angled. Roots tuberous, pyriform to globose, 0.8-2.8 cm in diameter, 1.2-5.7 cm long. Stems tuberculate, the axils naked; tubercles rhomboidal in cross section, lacking a dorsal sulcus, green, white-dotted, ca. 4 mm high, ca. 5 mm wide at the base, arranged in 13 and 21 spirals. Areoles elliptical 1.5-2.0 mm long, 1 mm wide, villous near apex, later glabrous, ca. 8 mm apart. Central spines 2, ca. 0.3 mm in diameter at the base, terete, proximally white, turning brown, then black above, the apical antrorse, mostly 12-15 mm long, ranging from 10 to 24 mm, the basal porrect, mostly 12-18 mm long, ranging from 10 to 21 mm. Radial spines mostly 18 to 20, rarely as few as 14 or as many as 28, acicular, white, the extreme apex usually brown or reddish; the lowermost (retrorse) radial spines shortest, these ca. 3-6 mm long and 0.1 mm in diameter at the base, progressively longer above, the uppermost (antrorse) radial spines longest, usually ca. 17 mm, rarely to ca. 29 mm long, 0.2 mm in diameter at the base. Flowers ca. 2 cm in diameter, ca. 2.5 cm high. Outer perianth segments oblong, entire, mucronulate, the lowermost ca. 8 mm long and 3 mm wide, with a white, translucent margin, midvein green, becoming dark purple above. Inner perianth segments narrowly oblanceolate, apex emarginate and often mucronulate, ca. 15 mm long and 4 mm wide, pale to dark magenta with darker midvein. Anthers yellow; filaments yellow. Style ca. 11 mm long; stigma lobes 7 to 9, pale yellow, protruding ca. 5 mm above the anthers. Fruit dark green to purple, pulverulent, longitudinally dehiscent, ca. 6 mm in diameter and 7 mm high, attached at the base of an apical areole, with two stramineous scales ca. 1 mm long.

In the treatments of both Anderson (1986) and Bravo *et al.* (1991), *Turbinicarpus booleanus* will key to *T. mandragora* (A. Berger) A.D. Zimmermann and *T. subterraneus* (Backeb.) A.D. Zimmermann var. *subterraneus* because of their tuberous roots connected to the stem by an elongate neck. These three taxa are widely separated geographically (Map 1). *Turbinicarpus booleanus* is unique among them in having only about a third of the main stem body above ground; this correlates with the porrect central spines which are directed vertically. In the length of its neck, *T. booleanus* is more similar to *T. mandragora*, but the latter has a more or less globose, epigeous body; brown-tipped (vs. mostly black) central spines that spread perpendicularly away from the body; fewer radial spines per areole (8 to 14 vs. 14 to 28); and white (vs. magenta) flowers. This species is known only from its type locality, near Parras, in southern Coahuila. Though closer geographically to *T. subterraneus* var. *subterraneus*, *T. booleanus* is easily distinguished from this taxon by its shorter, thicker, hypogeous neck with partially hypogeous body; and more and longer radial spines that are brown at the apex (vs. glassy-white throughout). *Turbinicarpus subterraneus* var. *subterraneus* grows about 75 km to the south of *T. booleanus* on low shrubby limestone hills with *Agave*, *Dasylirion*, *Flourensia*, *Larrea*, *Mortonia*, and *Yucca*, the plants incredibly suspended on their long necks. *Turbinicarpus booleanus* is found infrequently only on bare, exposed gypsum slopes with *Dasylirion berlandieri*, *Muhlenbergia gypsophila*, *Pinus greggii*, *Selaginella gypsophila*, and *Yucca decipiens*.

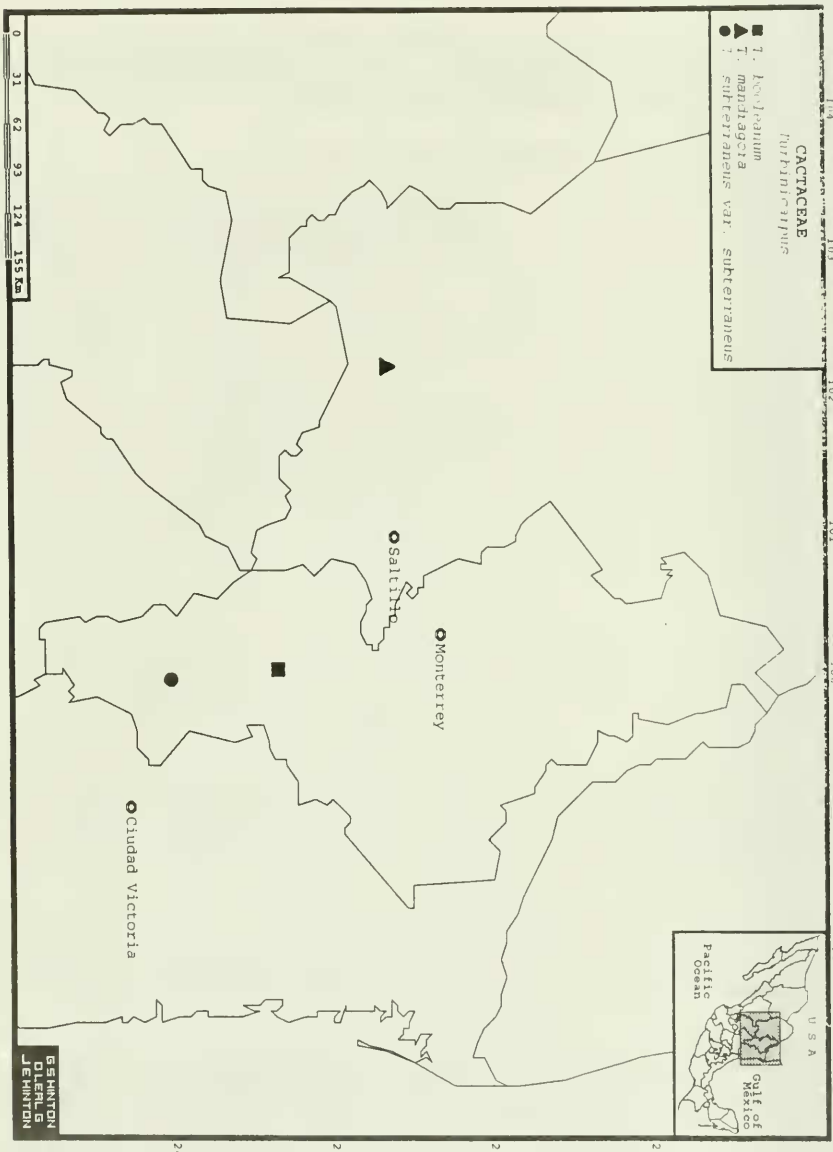

Figure 1: Map of the distributions of *Turbinicarpus booleanus*, *T. subterraneus* var. *subterraneus*, and *T. mandragora*.

Figure 2: Photograph of the holotype of *Turbinicarpus booleanus*.

It is a pleasure to name this novelty for my son George Boole, who, though only five years old, accompanies me regularly on my field trips throughout Nuevo León and Coahuila.

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